

ECON 251: Model Assignment 2

Due Wednesday November 30 by 11:00 PM

Your assignment is to write down an economic model, a formal mathematical framework characterizing an individual choice situation similar to (but **not** identical to) the ones discussed in class. For this assignment, you should characterize an intertemporal tradeoff not covered in lecture or on a problem set.

Describe a plausible, socially and economically relevant individual tradeoff involving a time dimension, where a utility-maximizing individual would be influenced by their discount factor. Describe an individual who has a budget measured in units of a scarce resource that they need to allocate (i.e. divide or spend). The choice situation that you describe can reflect your own life, or it can reflect a choice setting that you think is socially, economically, or psychologically important. Your setup should not be one that we covered in class.

I encourage you to be creative both conceptually and mathematically. Your mathematical characterization of the intertemporal tradeoff should reflect something fundamental about the nature of the choice that your decision-maker is facing, and ideally this will not simply be a re-labeling of a mathematical setup that we have already analyzed.

Your submission should be typed, and it should not be longer than two sides of a page in 11-point or 12-point font. Submissions must be pdfs, which you will upload to gradescope. Your submission must include the following:

- A brief introductory paragraph (one or two sentences) explaining the economic context you are modeling
- A clear explanation of what the budget is: what is the scarce resource being allocated, and what units are we measuring it in?
- A clear and specific description of the intertemporal choice problem you are modeling: what are the costs and benefits, and when do they occur?
- A characterization of the consumer's utility function, and the demand function that results from utility maximization

What I Am Looking For:

I want to see you apply the theoretical tools that we are building in class to a new and economically interesting situation (remember: Gary Becker tells us economics is an approach and not a topic, so feel free to think outside the box). I am looking to see you represent a decision problem in mathematical terms, as a tradeoff characterized by a budget set and implicit or explicit prices or opportunity costs.

In grading your assignments, I will be looking at the following:

- Is your setup both conceptually and mathematically different from the ones we've discussed in class?
- Is your setup interesting and important? This does not mean that you need to write about climate change – there are a lot of great economics papers written about when people go to the gym – but it should capture an important tradeoff that many people face, and one that has economic or social consequences.

- Does your mathematical representation of the choice capture some fundamental intuition about the nature of the tradeoff your decision-maker is facing?
- Have you included everything I asked? Is the information presented clearly, and in a way that is easy for me to read and understand?
- Have you translated your verbal description into a correct mathematical description of the budget set and the choice problem?
- Have you solved the utility maximization problem correctly?

As I said before, it should be fairly easy for you to do an acceptable-but-not-great job on this assignment. But it is **very** hard to do everything that I have asked for successfully. I strongly encourage you to keep your model simple, so that you are able to solve it correctly.